Comment RE UTNV Agreement DUST ISSUE
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Comment to UT/NV Agreement

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Dust storms spread deadly diseases worldwide

Dust storms like the one that plagued Sydney are blowing bacteria to all corners of the globe, with viruses that will attack the human body. Yet these scourges can also help mitigate climate change.

A dust storm blankets Sydney's iconic Opera House at sunrise. Photograph: Tim Wimborne/Reuters

Huge dust storms, like the ones that blanketed Sydney twice last week, hit Queensland yesterday and turned the air red across much of eastern Australia, are spreading lethal epidemics around the world. However, they can also absorb climate change emissions, say researchers studying the little understood but growing phenomenon.

The Sydney storm, which left millions of people choking on some of the worst air pollution in 70 years, was a consequence of the 10-year drought that has turned parts of Australia's interior into a giant dust bowl, providing perfect conditions for high winds to whip loose soil into the air and carry it thousands of miles across the continent.

It followed major dust storms this year in northern China, Iraq and Iran, Pakistan, Saudi Arabia, Afghanistan, east Africa, Arizona and other arid areas. Most of the storms are also linked to droughts, but are believed to have been exacerbated by deforestation, overgrazing of pastures and climate change.

As diplomats prepare to meet in Bangkok tomorrow for the next round of climate talks, meteorologists predict that more major dust storms can be expected, carrying minute particles of beneficial soil and nutrients as well as potentially harmful bacteria, viruses and fungal spores.

"The numbers of major dust storms go up and down over the years," said Andrew Goudie, geography professor at Oxford University. "In Australia and China they tailed off from the 1970s then spiked in the 1990s and at the start of this decade. At the moment they are clearly on an upward trajectory."

Laurence Barrie is chief researcher at the World Meteorological Organisation (WMO) in Geneva, which is working with 40 countries to develop a dust storm warning system. He said: "I think the droughts [and dust storms] in Australia are a harbinger. Dust storms are a natural phenomenon, but are influenced by human activities and are now just as serious as traffic and industrial air pollution. The minute particles act like urban smog or acid rain. They can penetrate deep into the human body."

Saharan storms are thought to be responsible for spreading lethal meningitis spores throughout semi-arid central Africa, where up to 250,000 people, particularly children, contract the disease each year and 25,000 die. "There is evidence that the dust can mobilise meningitis in the bloodstream," said Barrie.

Higher temperatures and more intense storms are also linked to "valley fever", a disease contracted from a fungus in the soil of the central valley of California. The American Academy of Microbiology estimates that about 200,000 Americans go down with valley fever each year, 200 of whom die. The number of cases in Arizona and California almost quadrupled in the decade to 2006.

Scientists who had thought diseases were mostly transmitted by people or animals now see dust clouds as possible transmitters of influenza, Sars and foot-and-mouth, and increasingly responsible for respiratory diseases. A rise in the number of cases of asthma in children on Caribbean islands has been linked to an increase in the dust blown across the Atlantic from Africa. The asthma rate in Barbados is 17 times greater than it was in 1973, when a major African drought began, according to one major study. Researchers have also documented more hospital admissions when the dust storms are at their worst.

"We are just beginning to accumulate the evidence of airborne dust implications on health," said William Sprigg, a climate expert at Arizona University.

The scale and range of some recent dust storms has surprised scientists. Japanese academics reported in July that a giant dust storm in China's Taklimakan desert in 2007 picked up nearly 800,000 tonnes of dust which winds carried twice around the world.

Dust from the Gobi and Taklimakan deserts is often present over the western United States in the spring and can lead to disastrous air quality in Korean, Japanese and Russian cities. It frequently contributes to the smogs over Los Angeles. Britain and northern Europe are not immune from dust storms. Dust blown from the Sahara is commonly found in Spain, Italy and Greece and the WMO says that storms deposit Saharan dust north of the Alps about once a month. Last year Britain's Meteorological Office reported it in south Wales.

Some scientists sought to attribute the 2001 foot-and-mouth outbreak to a giant storm in north Africa that carried dust and possibly spores of the animal disease as far as northern Britain only a week before the first reported cases.

The scale and spread of the dust storms has also surprised researchers. Satellite photographs have shown some of the clouds coming out of Africa to be as big as the whole land mass of the US, with a major storm able to whip more than a million tonnes of soil into the atmosphere. Sydney was covered by an estimated 5,000 tonnes of dust last week, but the WMO says Beijing was enveloped by more than 300,000 tonnes in one storm in 2006.

"The 2-3 billion tonnes of fine soil particles that leave Africa each year in dust storms are slowly draining the continent of its fertility and biological productivity," said Lester Brown, director of the Earth Policy Institute research group in Washington DC. "Those big storms take millions of tonnes of soil, which takes centuries to replace."

Brown and Chinese scientists say the increased number of major dust storms in China is directly linked to deforestation and the massive increase in numbers of sheep and goats since the 1980s, when restrictions on herders were removed. "Goats will strip vegetation," said Brown. "They ate everything and dust storms are now routine. If climate change leads to a reduction in rainfall, then the two trends reinforce themselves." China is planting tens of millions of trees to act as a barrier to the advancing desert.

However, research increasingly suggests that the dust could be mitigating climate change, both by reflecting sunlight in the atmosphere and fertilising the oceans with nutrients. Iron-rich dust blown from Australia and from the Gobi and Sahara deserts is largely deposited in oceans, where it has been observed to feed phytoplankton, the microscopic marine plants that are the first link in the oceanic food chain and absorb large amounts of carbon dioxide. In addition, the upper layers of the rainforest in Brazil are thought to derive much of their nutrient supply from dust transported across the Atlantic from the Sahara.

Just as scientists struggle to understand how dust is affecting climate, evidence is growing that another airborne pollutant, soot, is potentially disastrous. Minute particles of carbon produced by diesel engines, forest fires and the inefficient burning of wood in stoves is being carried just like dust to the remotest regions of the world.

A study by the United Nations Environment Programme has just concluded that the pollutant has played a major part in shrinking the Himalayan glaciers and has helped to disrupt the south Asian monsoon.

"Soot accounts from 10% to more than 45% of the contribution to global warming," said Achim Steiner, director of the UN's environment programme. "It is linked to accelerated losses of glaciers in Asia because soot deposits darken ice, making it more vulnerable to melting."

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"I manage the process that identifies and brings together stakeholders, expertise, and funding sources to address current and future water and other natural resource challenges for communities, businesses, non-profits, and governments."

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